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ASSOCIATION: Fizicheskiy institut im.P.N.Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR)

ENCL: 01

SUBMITTED: OO

OTHER: 002

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NR REF Sov: 007

3/4

L 4403-60 CNI(1)/CNI(m)/FOX/1/CNA(m)-2/ENR(h) 6#

ACC NR: AP5024622

SOURCE CODE: UR/0048/65/029/009/1640/1643

AUTHOR: Zelevinskaya, N.G.; Maksimenko, V.M.; Slavatinskiy, S.A.; Sokolovskiy, V.V.

ORG: none

TITLE: On the angular distribution of secondaries in elementary multiple production events at high energies /Report, All-Union Conference on Cosmic Ray Physics held at Apatity 24-31 August 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 9, 1965, 1640-1643

TOPIC TAGS: primary cosmic ray, secondary cosmic ray, nucleon interaction, inelastic interaction, pi meson, particle production

ABSTRACT: The authors have calculated the distribution to be expected for elementary multiple production events with respect to the absolute difference between the numbers of forward and backward secondaries on the assumptions that energy, momentum, and charge are conserved, that all the secondaries are ultrarelativistic pions, and that the probability for any possible distribution of momentum among the secondaries is proportional to the corresponding volume of phase space. The details of this calculation are not discussed, but the results are presented and are compared with the observed distribution for multiple production events of multiplicity 4 or greater. Many more highly asymmetric events are observed than are predicted by the calculation, and it is concluded that statistical factors cannot account for the asymmetry of multiple

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L 4463-56

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production. One must take account of the asymmetry of multiple production when investigating the energy dependence of different features of the process. In particular, the apparent energy dependence of the inelasticity found by W. Fetter and L. Hansen (Phys. Rev., 118, 812, 1960) and by I. Kita and G. Fujioka (J. Phys. Soc. Japan, 18, 1099, 1107, 1961) can be accounted for in terms of an energy independent inelasticity and an asymmetric multiple production process. Orig. art. has: 6 formulas, 2 figures, and 1 table.

SUB CODE: NP/ SUBM DATE: 00/- ORIG REF: 003/ OTH REF: 003

GC
Card 2/2

GUSEVA, V.V.; LEBEDEV, A.M.; SLAVATINSKIY, S.A.; SOKOLOVSKIY, V.V.

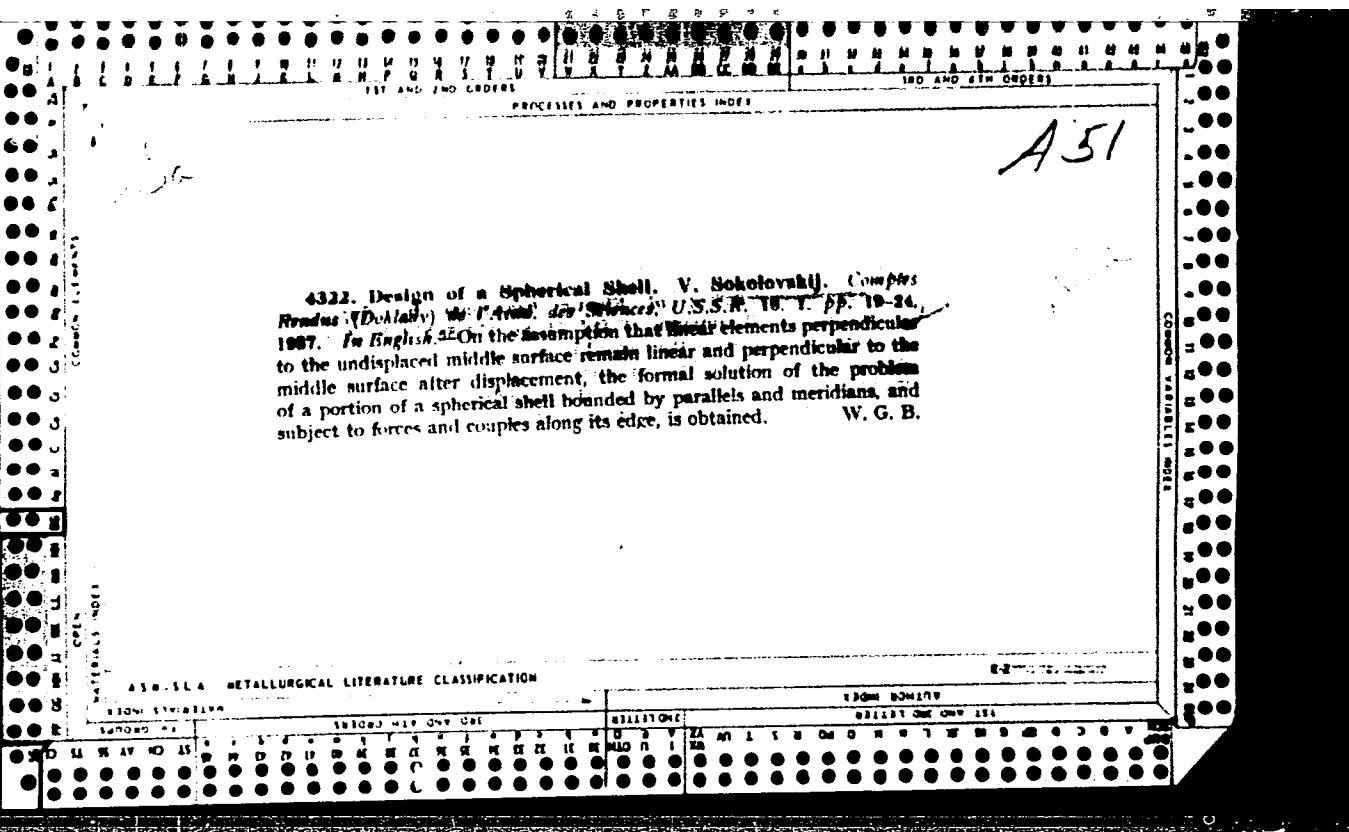
Interaction between nucleons and complex nuclei at high energies.
Izv. AN SSSR, Ser. fiz., 22 no. 10/1935-1937 O '65.

(MIRA 18:10)

2934. Theory of Shells. V. Nekrasov. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 14, 8, pp. 483-486, 1937. In English.—The equations for axially symmetrical elastic shells may, in certain cases, be reduced to a set of second order equations. The catenoid is shown to be one such; and the functions occurring in the analytical solution in this case are determined.

Z
Dokl. AN SSSR

W. G. B.



SOKOLOVSKIY, V.V.

"Über Die Berechnung sphärischer Schalen," Vertrag Auf Der Allunionstagung Über
Baumechanik 1936, Veröffentlicht In: Leitsatzen zu den Berichten Auf Der Allunionstagung
für Baumechanik, Moskau-Leningrad 1936

SCHAEFERSKI, V. V.

"Über spannungsfreie Rotations-Schalen"
Angewandte Mathematik und Mechanik Band 1 Heft 3 Seite 291-316, 1938

SOKOLOVSKIY, VASIL'YEVICH

Ploskaiia zadacha teorii plastichnosti po Prandtliu teorii davleniya zemli.
(Akademiiia Nauk SSSR. Izvestiia. Otdelenie tekhnicheskikh nauk. 1939,
no. 2, p. 107-128, and no. 3, p. 63-84, diagrs., bibliography)

Title tr.: Prandtl's two-dimentional theory of plasticity and theory of earth
pressure.

AS 62. A6244 1939

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congress,
1955.

"APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652120019-4

CONFIDENTIAL

"Die politische Lage im bzw. hinter den Grenzen," Abhandlung des
Festes für Geschichte der DDR, Band 22 Nr. 4 Seite 15 - 17 1989.

APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652120019-4"

"APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652120019-4

SOKOLOVSKIY, V.V.

"Über Eine Aufgabe Aus Der Theorie Des Erddruckes," Abhandlungen Der Akademie Der Wissenschaften Der UDSSR Band 23 Nr. 1 Seite 153-157 1939.

APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652120019-4"

OKHLOPKOV, V.V.

"Die Grenz-Spannungszustände in Streuenden Und Geschichteten Medien,"
Abhandlungen Der Akademie Der Wissenschaften der UdSSR Band 24 Nr. 8 Seite
731-736 1939

COMMUNITY, U.S.

"Die Verallgemeinerung Der Aufgabe Von Prandtl Fur Geschichtete Medien,"
Abhandlungen Der Akademie Der Wissenschaften Der UdSSR Band 24, Nr. 8 Seite
737 - 740 1939.

24

B

The Pressure of a Plastic Solid on a Rigid Wedge.
V. V. Sokolovskii. 24 pages. 1947. Graduate Division
of Applied Mathematics, Brown University, Provi-
dence, R.I. (Translation RMB-23.) From Priklad-
naya Matematika i Mekhanika, 1940, p. 19-34.

The pressure distribution under a rigid wedge
which is impressed into a plastic solid is derived.
The derivation is based on the assumption of
plane strain.

ASA-51A METALLURGICAL LITERATURE CLASSIFICATION

"APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652120019-4

Sokolovskiy, V. V.

"On the Pressure of a Plastic Solid on a Rigid Wedge", Prikladnaya Matematika i Mekhanika, 1940, Vol 4, Nos 5-6.

APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652120019-4"

SOKOLOVSKIY, V.V.

"Die Statik Von Streuenden Medien," Verlag Der Akademie Der Wissenschaften
Der UdSSR Moskau - Leningrad 1942 207 Seiten.

SOKOLOVSKIY, VASILEV VASILEVICH.

Ob odnoi zadache uprugo-plasticheskogo krucheniia. (Prikladnaia matematika i mekhanika, 1942, v. 6, no. 2-3, p. 241-246, diagrs.)

Summary in German.

Title tr.: On a problem of elastic-plastic torsion.

QA801.P7 1942

SC: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congress, 1955.

SOKOLOVSKIY, V.V.

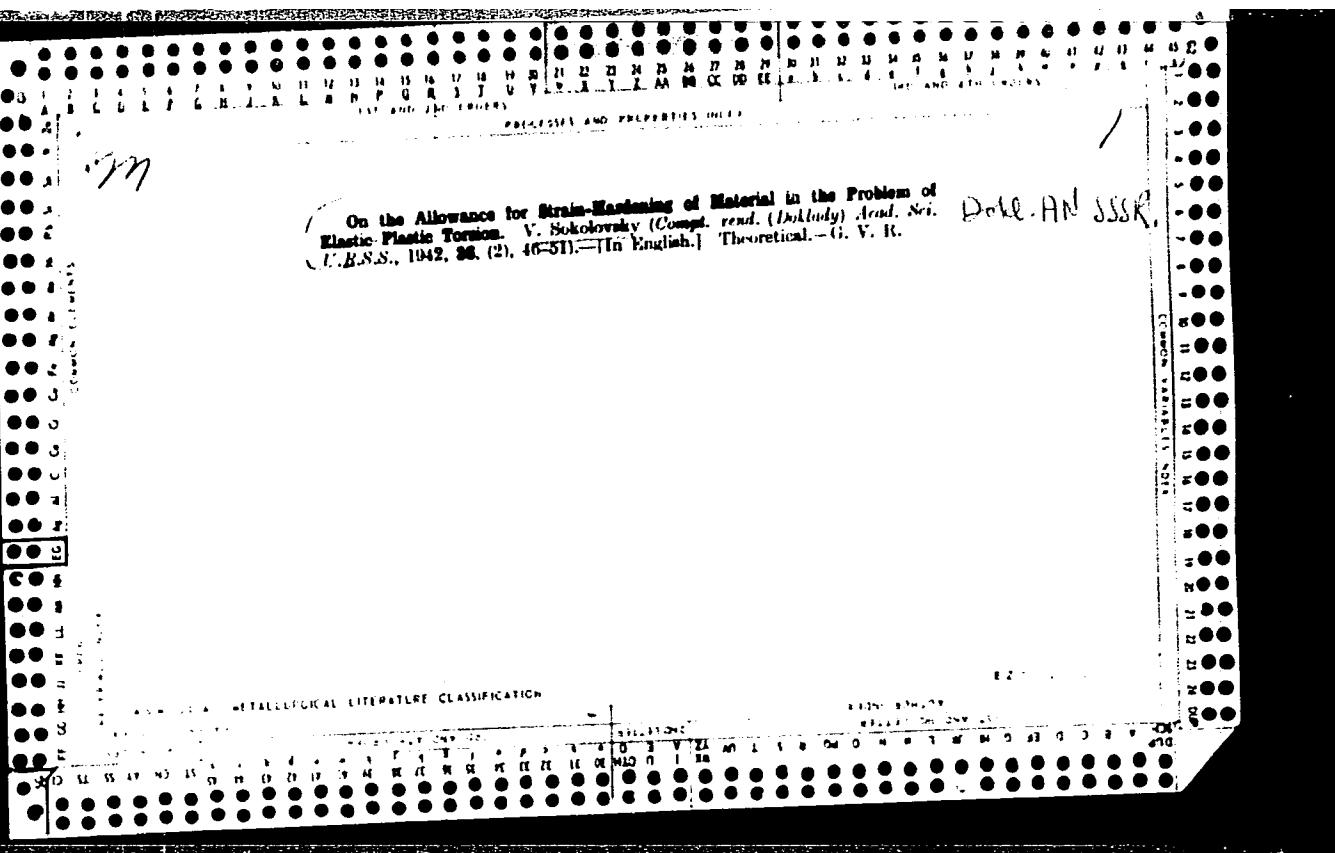
"Die Grundlegenden Gleichungen Fur Das Grens-Gleichgewicht Eines Stromenden Mediums," Abhandlungen Der Akademie Der Wissenschaften Der UdSSR Band 34 Nr. 2 Seite 52 - 57 1942.

JOKOLOWSKIY, V.V.

"Über Die Standfestigkeit Ven Dusmen," Abhandlungen Der Akademie Der
Wissenschaften Der UdSSR Band 34 Nr. 3 Seite 79 - 85 1942.

"APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652120019-4

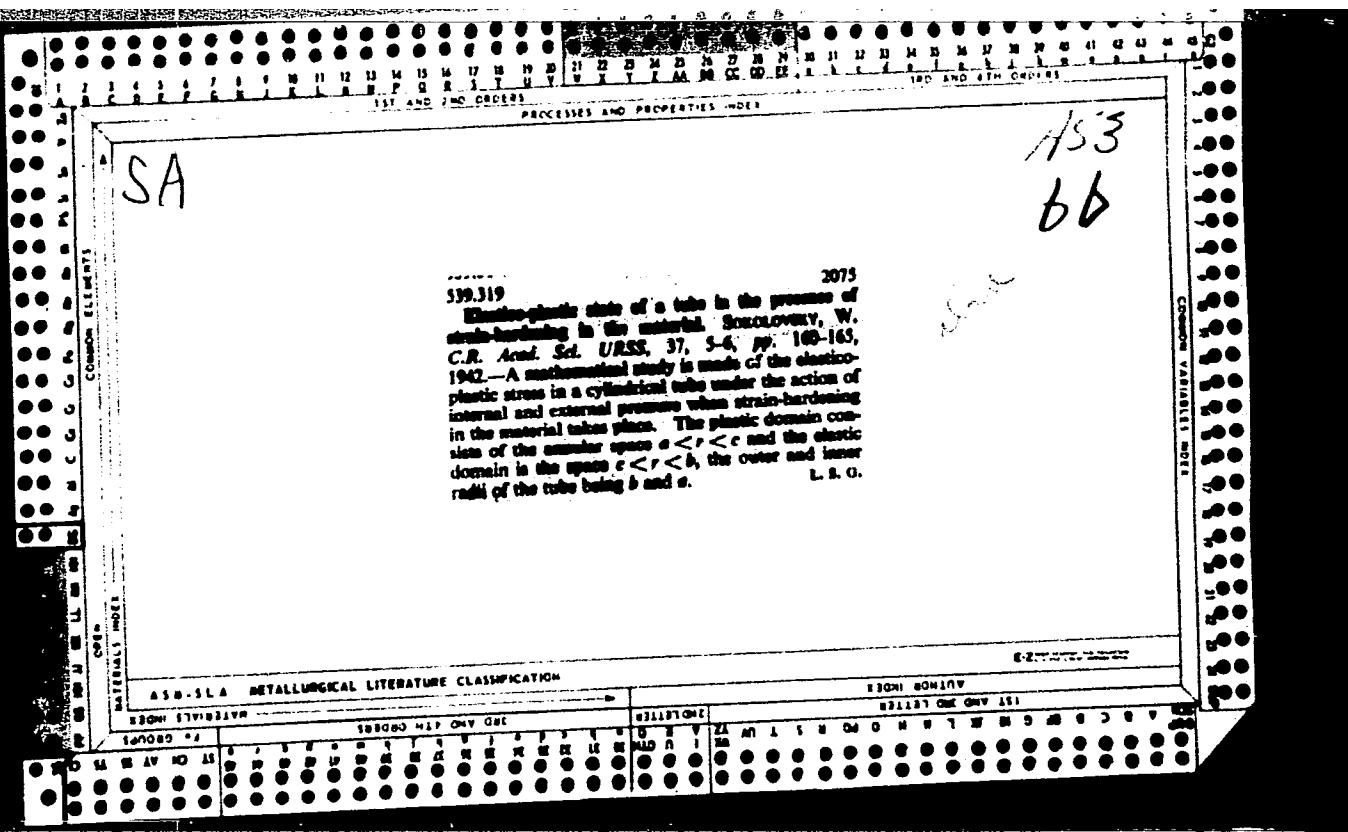


APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652120019-4"

ZOKALOVSKIY, V.V.

"Über Die Berechnung Der Materialwerte Bei Problemen Der Elastisch - Plastischen Drehungen," Abhandlungen Der Akademie Der Wissenschaften Der UdSSR Band 36 Nr. 2 Seite 51 - 57 1942



SOKOLOVSKIY, V.V.

"Klastisch-Plastische Spannungszustande in Rehren Bei Materialbestimmungen,"
Abhandlungen Der Akademie Der Wissenschaften Der UdSSR Band 37 Nr. 5/6 Seite
184 - 190 1942.

БОКСИЧКИЙ, В.В.

"Die Gleichgewichtsbestimmung in Spannangelesen Schalen," Angewandte Mathematik
Und Mechanik Band 7 Heft 1 Seite 57 - 64 1943. Eine BEMerkung Su Dieser
Veröffentlichung Erschien in Angewandter Mathematik Und Mechanik Band 6 Heft 1
Seite 88 1944

BOKOLOVSKIY, V.V.

"Elastisch-Plastische Spannungszustände in Rehren, Die Sich unter Der Einwirkung Gleicher innerer Und äusserer Drucke Befinden," Angewandte Mathematik und Mechanik Band 7 Heft 1 Seite 74 - 85 1948.

24

B

Elastic-Plastic Equilibrium of a Tube Made of a Material with Strain-Hardening. V. V. Sokolovskii. 36 pages. 1947. Graduate Division of Applied Mathematics, Brown University, Providence, R.I. (Translation RMB 22.) From *Prikladnaya Matematika i Mekhanika*, 1943, p. 273-292.

Concerned with the elastic-plastic equilibrium of a cylindrical tube under combined interior and exterior pressure and axial force. The discussion is based on Hencky's theory of plasticity and Schmidt's law of strain hardening.

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION

SOKOLOVSKIY, V. V.

"Das elastisch-plastische Gleichgewicht eines vellen Engel bei
Verhandensein von Materialfestigung"
Angewandte Mathematik und Mechanik Band 8 Heft 1 Seite 70-78, 1944

DR. RUDOLF VÖLKL, V.V.

"Die Elastisch-Plastische Biegung Einer Runden Und Ringformigen Platte,"
Angewandte Mathematik Und Mechanik Band 8 Heft 2 Seite 141 - 166 1944.

KOGANOVICH, V.V., VOLKOV, B.G., KLOKHIN, N.L.

"Mechanik," Dreschieren im Buch : Sowjetische Technik in 25 Jahren Moskau - Leningrad 1945 Seite 7 - 31.

JURGEN WORITZ, V. V.

"Über einige Arbeiten Über die Plastizitäts-Theorie"
Vertrag auf der 220 Jährstagung der Akademie der Wissenschaften der UdSSR von 15
Juni bis 3 Juli 1945 Vertrag auf der Jubileumstagung des Institutes für Mechanik
der Akademie der Wissenschaften der UdSSR am 21., Juni 1945 in Moskau

Veröffentlicht in Jubiläumsband der Akademie der Wissenschaften der UdSSR Seite
455-471 1947 Veröffentlicht auch in: Vestnik der Akademie der Wissenschaften
der UdSSR 1945 Heft 6 Seite 106-117 Veröffentlicht außerdem in: Angewandte
Mathematik und Mechanik Band 9 Heft 6 Seite 495-508, 1945

SOKOLOVSKIY, VASILIY VASILYEVICH

Uravneniya plasticheskogo ravnovestitiia pri ploskem napriazhennom sostoianii.
(Prikladnaia matematika i mekhanika, 1945, v. 9, no. 1, p.111-128, diagrs.)

Summary in English.

Title tr.: Equations of plastic equilibrium for a state of plane stress.

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congress
1955

"APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652120019-4

AMERICAN M.M.

"Einige Probleme Beim Ueberen Plastischen Spannungszustand," Angewandte
Mathematik Und Mechanik Band 9 Heft 3 Seite 219 - 232 1945.

APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652120019-4"

SOKOLOVSKIY, VASILII VASILEVICH.

Plasticheskoe Kruchenie Kruglykh valov peremennogo diametra. (Prikladnaya matematika i mehanika, 1945, v. 9, no. 4, p. 343-346, diagrs.)

Summary in English.

Title tr.: Plastic torsion of a shaft of circular cross section and variable diameter.

QA001.P7 1945

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congress, 1955.

Senilovskij, Vasiliy Vasilevich.

O nekotorykh rabotakh po teorii plastichnosti. (Prikladnaia matematika i mekhanika, 1945, v. 9, no. 6, p. 495-508, bibliography)

Summary in English.

Title tr.: Survey of works on the theory of plasticity.

QA801.P7 1945

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congress, 1955.

SOKOLOVSKIY V.V.

2

*Sokolovskii, V. V. Teoriya Plastičnosti. [Theory of Plasticity]. Izdatel'stvo Akademii Nauk SSSR, Moscow-Leningrad, 1946. 306 pp.

261 By far the greater part of this book is concerned with the classical theory of plasticity [Saint Venant, Lévy, von Mises]. As far as this particular theory of plasticity is concerned, the present book doubtless constitutes the most complete treatment available to date. Unfortunately, other theories of equal practical importance or mathematical interest are barely mentioned, or not at all, so that the uninitiated reader will receive the impression that the classical theory is the only one that matters. The basic equations of the classical theory are developed in the first two chapters which also contain some remarks concerning mechanical similarity in the plastic range. The wide range of topics treated in the remaining ten chapters is best illustrated by the following list: problems with cylindrical or spherical

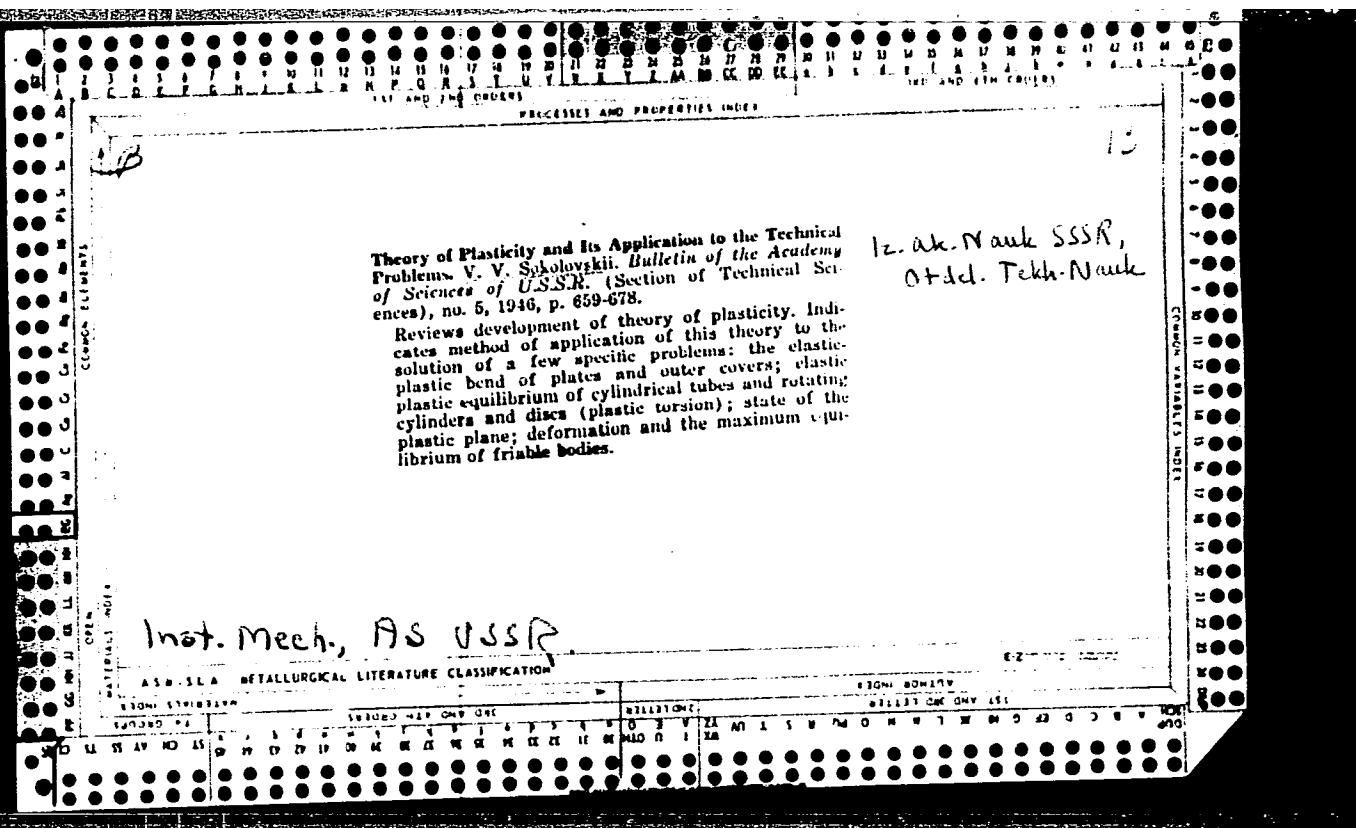
symmetry; torsion of cylindrical and prismatic bars and of bodies of revolution; problems of plane strain (plastic stress distributions in the neighborhood of cut-outs, impression of a rigid wedge into a plastic body, rolling and drawing); problems of plane stress (contrary to what is the case for plane strain, it makes a difference here whether the yield condition of Saint Venant or that of von Mises is used); bending of beams and plates. Throughout the book, the author stresses methods of approximate numerical integration which permit the handling of much more complicated boundary conditions than are accessible to analytical methods.

W. Prager (Providence, R. I.).

Source: Mathematical Reviews,

Vol. 8 No. 9

JHM



SOKOLOVSKIY, V.V.

Sokolovsky, W. W. Plastic equilibrium of a plane stressed state. *Appl. Math. Mech. [Akad. Nauk SSSR. Prikl. Mat. Mech.]* 10, 209-220 (1946). (Russian, English summary) [MF 16845]

Sokolovsky, W. Plastic plane stressed state according to Saint-Venant. *C. R. (Doklady) Acad. Sci. URSS (N.S.)* 51, 421-424 (1946).

The two papers are concerned with statically determinate states of plane stress in a medium for which the yield condition of Saint Venant holds. This yield condition assumes different forms according to whether the nonvanishing principal stresses are of equal or opposite signs:

$$(\sigma_x - \sigma_y)^2 + 4\tau_{xy}^2 = \text{constant} = \sigma_0^2, \quad \sigma_x \sigma_y \leq \tau_{xy}^2, \\ (\sigma_x - \sigma_y)^2 + 4\tau_{xy}^2 = (2\sigma_0 - |\sigma_x + \sigma_y|)^2, \quad \sigma_x \sigma_y \geq \tau_{xy}^2,$$

The first form of the yield condition is fulfilled by setting

$$\sigma_x = A + \frac{1}{2}\sigma_0(2\omega + \cos 2\varphi), \quad \sigma_y = A + \frac{1}{2}\sigma_0(2\omega - \cos 2\varphi), \\ \tau_{xy} = \frac{1}{2}\sigma_0 \sin 2\varphi,$$

Source: Mathematical Reviews,

the second by setting

$$\sigma_x = \sigma_0[k(1-\omega) + \omega \cos 2\varphi], \quad \sigma_y = \sigma_0[k(1-\omega) - \omega \cos 2\varphi], \\ \tau_{xy} = \sigma_0 \omega \sin 2\varphi,$$

where $k=1$ if both σ_x and σ_y are positive and $k=-1$ if they are both negative. In each case the equations of equilibrium lead to two partial differential equations of the first order in ω and φ . In the first case this system is of hyperbolic type, in the second case, of parabolic type. As an example the author investigates the stresses in an infinite plastic slab with a circular or elliptic hole, the stresses at infinity being $\sigma_x = \sigma_y = \sigma_0$, $\tau_{xy} = 0$, the contour of the hole being subjected to a given normal stress. *W. Prager* (Providence, R. I.).

Vol. 8, No. 2

SOKOLOVSKIY, V.V.

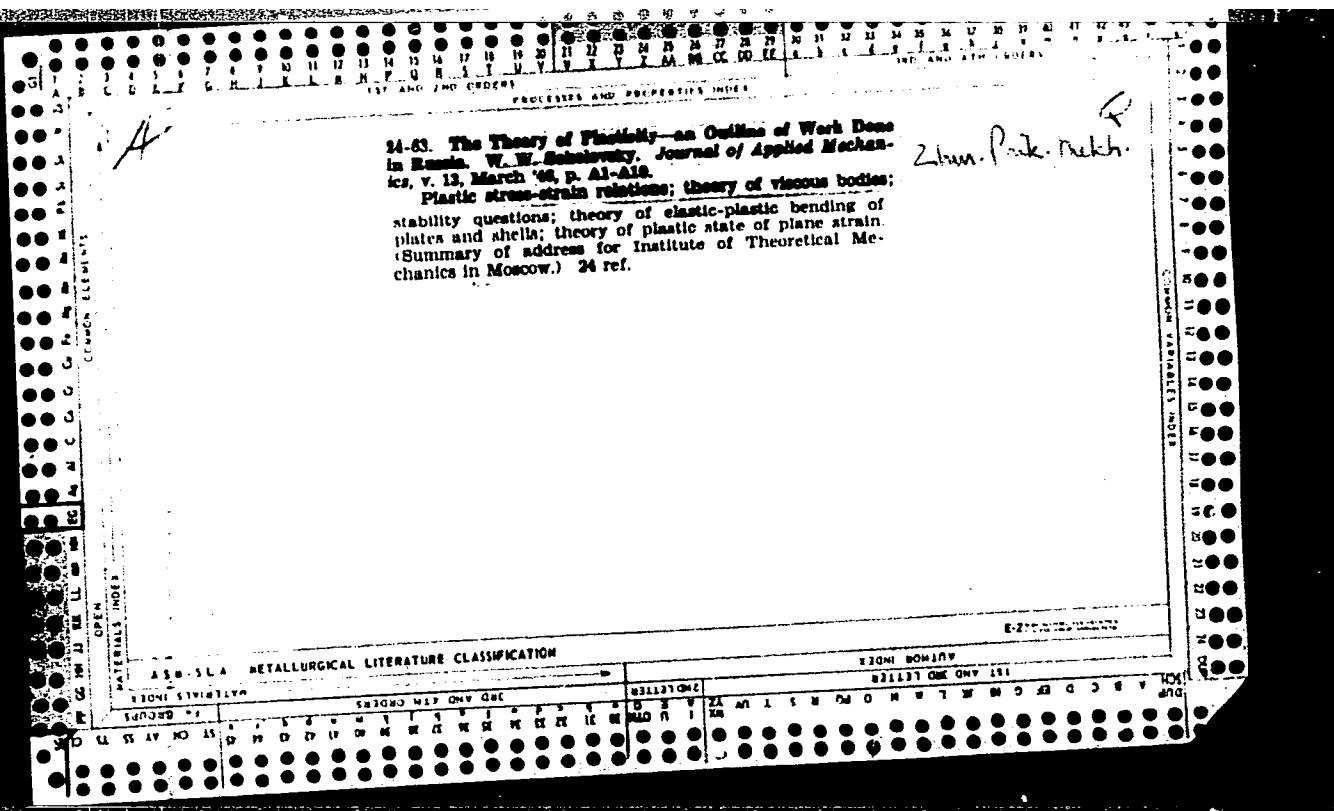
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Sokolovsky, W. W. Equations of the plane plastic stressed state according to the Mises theory and their approximate representation. Appl. Math. Mech. [Akad. Nauk SSSR. Prikl. Mat. Mech.] 10, 357-366 (1946). (Russian. English summary)

In recent papers [C. R. (Doklady) Acad. Sci. URSS (N.S.) 51, 175-178, 421-424 (1946); these Rev. 8, 114] the author discussed states of plane stress in plastic bodies which obey the yield conditions of von Mises or Saint Venant. If the nonvanishing principal stresses are denoted by σ_1 and σ_2 , the yield condition of von Mises is represented by an ellipse in the (σ_1, σ_2) -plane, the yield condition of Saint Venant by an inscribed hexagon. In the present paper, an intermediate yield condition is used which is represented by a dodecagon inscribed in the Mises ellipse. This yield condition is stated to be sufficiently close to the experimentally verified condition of von Mises, but more convenient for computational purposes. W. Prager (Providence, R. I.).

Source: Mathematical Reviews, Vol 8, No 4

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CIA-RDP86-00513R001652120019-4

SOKOLOVSKIY, V. V.

"Der ebene plastische Spannungszustand nach Miseses" Abhandlungen der Akademie
der Wissenschaften der UdSSR Band51 Nr. 3 Seite 171-174, 1946

APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652120019-4"

SOKOLOVSKY, V.

Sokolovsky, W. Plastic plane stressed states according to Mises. C. R. (Doklady) Acad. Sci. URSS (N.S.) 51, 175-178 (1946).

The paper is concerned with statically determinate states of plane stress in a plastic medium for which the yield condition of von Mises is valid,

$$\sigma_x^2 + \sigma_y^2 - \sigma_x \sigma_y + 3\tau_{xy}^2 = \text{constant} = \sigma_0^2.$$

This yield condition is fulfilled by setting

$$\begin{aligned}\sigma_x &= 3^{-1}\sigma_0(3^{1/2}\cos\omega - \sin\omega\cos 2\varphi), \\ \sigma_y &= 3^{-1}\sigma_0(3^{1/2}\cos\omega - \sin\omega\cos 2\varphi),\end{aligned}$$

$\tau_{xy} = 3^{-1}\sigma_0\sin\omega\sin 2\varphi$, where φ denotes the angle between the direction of the greatest principal stress and the x -axis. If these expressions for the stress components are introduced into the equations of equilibrium, simultaneous quasilinear partial differential equations of the first order are obtained for ω and φ . Contrary to the case for plane plastic strain, this system need not be of hyperbolic type. The integration of the system is discussed in the special case where it is of hyperbolic type ($\pi/6 < \omega < 5\pi/6$). W. Prager.

Source: Mathematical Reviews,

Vol. 15, No. 3

Inst. Mechanics, AS USSR

"APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652120019-4

1957, 1958.

"Der Ebene Plastische Spannungszustand Nach Sen-Venak," Abhandlungen Der
Akademie Der Wissenschaft Der UdSSR Band 51 Nr. 6 Seite 417 - 420 1946.

APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652120019-4"

SOKOLOVSKIY, V.V.

Sokolovsky, W. W. On a problem of elasto-plastic bending of plates. *C. R. (Deklady) Acad. Sci. URSS (N.S.)* 52, 13-16 (1946).

The paper is concerned with the elastic-plastic stresses in a simply supported circular plate under a uniformly distributed load. The plate material is supposed to be perfectly plastic and to obey Hencky's stress-strain relations. The spreading of the plastic regions with increasing load and the dependence of the central deflection on the intensity of the load are studied.

W. Prager (Providence, R. I.).

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Source: Mathematical Reviews.

Vol 8, No. 4

8PP

SOKOLOVSKIY, V. V.

V. V. Kokolovskiy-G. S. Shapiro

"Die Methode von B. G. Galerkin in der Elastizitätstheorie"
Vertrag auf der Tagung der Akademie der Wissenschaften anlässlich des 30. Jahrestages der Oktoberrevolution Veröffentlicht in Jubileumsband zum 30. Jahrestag der Oktoberrevolution Moskau-Leningrad 1947 Seite 559-570

SOKOLOVSKIY, V. V.

Z

Sokolovskii, V. V. Certain problems of the statics of plastic and granular substances. Izvestiya Akad. Nauk SSSR. Otd. Tehn. Nauk 1947, no. 10, 1275-1286 (1947).
(Russian)

A brief survey of the author's recent contributions to the theory of plastic or granular media [cf. the author's books "Statics of Earthy Media," 1942; "Theory of Plasticity," 1946; these Rev. 6, 27; 8, 545]. W. Prager.

Source: Mathematical Reviews, 1948, Vol. 9, No. 5

PM

SOKOLOVSKIY, V.V.

J

Sokolovskii, V. V. Plane limiting equilibrium of geological strata. Izvestiya Akad. Nauk SSSR. Otd. Tekhn. Nauk 1948, 1361-1370 (1948). (Russian).

Two-dimensional states of limiting equilibrium in soils are discussed under the assumption that the shearing stress in the slip planes is a function of the normal stress on these planes that is characteristic for the soil under consideration. While the problem is formulated in fairly general terms, the examples treated in the paper are rather elementary.

W. Prager (Providence, R. I.).

ff

Source: Mathematical Reviews,

Vol 10 No. 7

SOKOLOVSKIY, V. V.

24/49T27

USSR/Engineering
Casings
Mathematics, Applied

Dec 48

"Review of A. I. Lur'ye's 'Statics of Thin-Walled Elastic Casings,'" V. V. Sokolovskiy, Corr Mem, Acad Sci USSR, G. Yu. Dzhanelidze, 2 pp

"Iz Ak Nauk SSSR, Otdel Tekh Nauk" No 12

Favorable review of subject work on two important problems in the theory of casings: equilibrium of symmetrically loaded rotating surfaces (casings), and equilibrium of arbitrarily loaded cylindrical casings.

24/49T27

SOKOLOVSKIY, V.V.

200

Sokolovskii, V. V. Plastic stresses in rotating disks.
Akad. Nauk SSSR. Prikl. Mat. Mekh. 12, 87-94 (1948).
(Russian)

The paper is concerned with the stresses in a rotating disk with step-profile in the case where the angular velocity is sufficiently large to cause permanent deformations. The disk material is supposed to be strain-hardening and to follow stress-strain relations of the Hencky-Nadai type (deformation type). [As A. A. Il'yushin has shown [Appl. Math. Mech. [Akad. Nauk SSSR. Prikl. Mat. Mech.] 10, 347-356 (1946); these Rev. 8, 240], the use of stress-strain relations of this type is justified only if the directions of the principal axes and the ratios between the principal components of the stress deviator remain constant during the loading process. While the first of these conditions is fulfilled for the present problem, the second is not. The validity of the author's results may therefore be questioned.]

W. Prager (Providence, R. I.).

Source: Mathematical Reviews,

Vol 9 No. /

for ref

SOKOLOVSKIY, V.V.

Sokolovskii, V. V. The propagation of elastic-viscoelastic plastic waves in bars. Akad. Nauk SSSR. Prez. Mezhdunarodn. Mezh. 12, 261-280 (1948). (Russian)

The theory of the propagation of stress waves in rods is developed for materials with stress-strain relations of the form $E\dot{e}/dt = d\sigma/dt + \kappa F(|\sigma| - \sigma_0)$, where F is a monotonically increasing function for positive argument, and zero for negative and zero argument, κ is a constant, and $\sigma_0 = \text{sign } \sigma$. Two uniform stress problems are first considered: a constant strain rate test and the effect of a triangular pulse of stress.

The equations of motion for a rod of varying section are shown to reduce to a pair of linear hyperbolic partial differential equations in the dependent variables σ and σ_0 (velocity). The characteristics in the (x, t) -plane are the same as for elastic waves; the differential relations along them are developed. A shock front of stress discontinuity is also shown to be propagated with the elastic wave velocity, and the Hugoniot relations across such a shock are stated. The variation of a stress discontinuity as it propagates is considered, using the Hugoniot relations across the shock and the relationship imposed along the characteristic coincident with the shock. The stress variation is thus determined by an ordinary differential equation, the solution being given for particular cases of cylindrical and conical rods.

Three illustrative problems are given for the special case in which F is a linear function, the stress, velocity, and strain distributions being determined by numerical integration along the characteristics: (1) a pulse of constant stress on the end of a semi-infinite cylindrical rod; (2) a triangular pulse of stress, with an instantaneous rise to the maximum value, acting on the end of a semi-infinite conical rod; (3) a finite cylindrical rod fixed at one end and free at the other, subjected to a suddenly applied constant stress at the free end.

E. H. Lee (Providence, R. I.)

Source: Mathematical Reviews,

Vol. 10 No. 3

SOKOLOVSKIY, V.V.

Sokolovskii, V. V. The propagation of cylindrical shear waves in an elastic-viscoplastic medium. Doklady Akad. Nauk SSSR (N.S.) 60, 1325-1328 (1948). (Russian)
This discussion is based on a stress-strain law suggested by K. Hohenemser and W. Prager [Z. Angew. Math. Mech. 12, 216-226 (1932)]. According to this law the material behaves in an elastic manner as long as the shearing stress does not exceed the yield limit; beyond this limit the shear rate is obtained as the sum of an elastic component which is proportional to the rate of the shearing stress, and a viscous component which is proportional to the excess of the shearing stress over the yield stress. Referred to cylindrical coordinates, the type of motion studied in the paper is characterized by the vanishing of the radial and axial velocity components; the circumferential velocity component is assumed to depend only on the radius r and the time t . The equations of motion are established and their integration by the method of characteristics is discussed. An illustrative example is worked out in detail.

W. Prager (Providence, R. I.).

Source: Mathematical Reviews,

Vol. 31 No. 10

SOKOLOVSKY, V. V.

PA 68195

USSR/Physics
Wave Propagation
Mechanics

May 1948

"Expansion of Elastic-Viscous-Pliable Waves in
Cores," V. V. Sokolovskiy, Corr Mem, Acad Sci,
Mechanics Inst, Acad Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LX, No 5

Short account of results obtained during studies
conducted on propagation of waves in beams composed
of material which had elastic as well as viscom-
pliable qualities. Submitted 20 Mar 1948.

68195

SOKOLOVSKIY, V.V.

Sokolovskii, V. V. On a form of representation of the components of stress in the theory of plasticity. Doklady Akad. Nauk SSSR (N.S.) 61, 223-225 (1948). (Russian) The author gives a parametric representation of the stress components with respect to an arbitrary set of rectangular axes in terms of the Eulerian angles of the principal axes of stress and three further parameters. One of these is proportional to the octahedral shearing stress; the other two do not seem to have immediate physical significance. The special cases of plane strain, plane stress, torsion, axially symmetric plane strain and axially symmetric plane stress are discussed. W. Prager (Providence, R. I.). *Spurlock*

Source: Mathematical Reviews,

Vol 10, No. 1

SKROLOVSKIY, VASILY VASILEVICH.

Ploskaia zadacha teorii plastichnosti o raspredeleнии napriazhenii vokrug otverstii. (Prikladnaya matematika i mehanika, 1949, v. 13, no. 2, p. 19-14)

Title tr.: A plane problem of the theory of plasticity on the distribution of stresses around an opening.

Correction of a misprint: see same periodical, 1949, v. 13, no. 3, p. 332.

QA801.P7 1949

SC: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congress, 1955.

SOKOLOVSKIY, V.V.

Sokolovskii, V. V. The equations of plastic equilibrium for
a plane stressed state. Akad. Nauk SSSR. Prikl. Mat.
Mekh. 13, 219-221 (1949). (Russian)

In several earlier papers and in his book on plasticity, the author has discussed the equations characterising statically determinate states of plane stress in a perfectly plastic material which obeys the yield condition of von Mises. It was shown that, contrary to what is the case for plane strain, these equations may be of hyperbolic or elliptic type. To a certain extent the hyperbolic case was discussed in the earlier papers, but not the elliptic case. In the present paper, a unified theory is developed which covers both cases. While, general representation formulas are established no specific examples are treated. W. Prager (Providence, R. I.).

Source: Mathematical Reviews,

Vol. 11 No. 1

SOKOLOVSKIY, V. V.
1156

AMR

Compressible Flow, Gas Dynamics 7

323. Sokolovskiy, V. V., On a transformation of the equations of plane flow of a gas (in Russian), *Prikl. Mat. Mekh.* 13, 253-256, 1949.

Author discusses a transformation of equations for plane irrotational flow. Subsonic and supersonic cases are discussed

separately. Transformation is similar to those previously introduced by Chaplygin and others. Both physical plane and hodograph plane are considered. Author indicates how some boundary conditions may be expressed in terms of new coordinates. However, no specific problems are completely formulated. Neither does author indicate any special advantage of the new transformations for solving any boundary-value problem.

Courtesy of Mathematical Reviews P. A. Lagerstrom, USA.

SOKOLOVSKIY, V.V.

Sokolovskiy, V. V. Approximate integration of the equations of a plane problem of the theory of plasticity.
Akad. Nauk SSSR. Prikl. Mat. Meh., 13, 321-322 (1949).
(Russian)

The author shows that under certain conditions the basic equations of two-dimensional plasticity can be written approximately so as to permit integration in closed form. This approximation is based on the replacement of $\exp(\xi + \eta)$ by an expression of the form $[A(\xi + \eta + a)]^n$, where ξ, η are the characteristic parameters and A, a, n are constants. Obviously, this is possible only if the range of $\xi + \eta$ happens to be sufficiently small for the problem under consideration.

W. Prager (Providence, R. I.).

Source: Mathematical Reviews,

Vol. 11 No. 1

Some sort

SOKOLOVSKIY, V.V.

Sokolovskii, V. V. On a plane problem of the theory of plasticity. Akad. Nauk SSSR. Prikl. Mat. Meh. 13, 391-400 (1949). (Russian)

The paper is concerned with states of plane strain in a plastic medium which obeys a yield condition of the type proposed by O. Mohr. If σ_1 and $\sigma_2 \leq \sigma_1$ denote the principal stresses in the plane of strain, the yield condition is assumed to have the form $\frac{1}{2}(\sigma_1 - \sigma_2)/k = \sin \left\{ \frac{1}{2}(\sigma_1 + \sigma_2)/k + H/k \right\}$, where H and k are constants and $\sigma_1 + \sigma_2$ is assumed to satisfy $-2H \leq \sigma_1 + \sigma_2 \leq -2H + k\pi$. W. Prager.

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Source: Mathematical Reviews, Vol. 11 No. 4

SERIALS/INT, C. I.

PALAYA

USSR/Hydrology - Filtration

Sep/Oct 49

"Nonlinear Filtration of Ground Waters," V. V.
Sokolovskiy, Moscow Inst of Mech, Acad Sci USSR,
12 pp

"Prik Mat i Mekh" Vol XIII, No 5

Discusses plane steady filtration of ground waters
governed by a definite type of nonlinear law.
Indicates a method to solve various problems on
basis of known solutions of corresponding problems
of filtration following the linear law. Submitted
24 Jun 49.

149T46

SOKOLOVSKIY, V. V.

PA 153T93

USSR/Physics - Plasticity

Nov/Dec 45

"Unidimensional Nonstationary Movements in a Visco-plastic Medium," V. V. Sokolovskiy, Inst of Mech, Acad Sci USSR, Moscow, 10 pp

"Prik Matemat i Mekh" Vol XIII, No 6

These movements are determined by the dependence between stress and strain, or deformation, as given in differential form. Discusses propagation of continuous waves of displacement, both planar and cylindrical, that are set up by boundary excitations.
Submitted 28 May 49.

153T93

SOKOLOVSKIY, V. V.

PA 153T91

USSR/Physics - Plasticity
Hardening

Nov/Dec 49

"Some Problems in the Theory of Plasticity With
Gradual Hardening of the Material," V. V. Sokolov-
skiy, Inst of Mech, Acad Sci USSR, Moscow, 4 pp

"Prik Matemat i Mekh" Vol XIII, No 6

Introduces two problems in the theory of plasticity,
which are solved for the case where material hardens
gradually. Submitted 20 Oct 49.

153T91

SOKOLOVSKIY, V.V.

100
Sokolovskiy, V. V. On the equations of nonlinear filtration.
Doklady Akad. Nauk SSSR (N.S.) 65, 617-620 (1949).
(Russian)

Pour étudier la théorie de filtration des eaux, l'auteur pose que la pente hydraulique est une certaine fonction de la vitesse de filtration: $\phi(v)$. Si cette fonction est linéaire en v on retrouve la loi de Darcy qui est valable pour le petit gravier. Pour le gros gravier la fonction n'est plus linéaire. L'auteur établit les équations de filtration non linéaire et montre que pour une fonction ϕ de la forme $vk^{-1}(1-(v/m)^2)^{-1}$ ($0 \leq v < m$, k et m ayant les dimensions d'une vitesse) on peut ramener ces équations à une forme très simple.

M. Kivelovitch (Paris).

Source: Mathematical Reviews, Vol. 10, No. 9
61A5

SOKOLOVSKIY, V.V.

*Sokolovskii, V. V. Teoriya plastichnosti. [Theory of Plasticity]. 2d ed. Gosudarstv. Izdat. Tehn.-Teor. Lit., Moscow-Leningrad, 1950. 396 pp.

This, the second, edition of the book presents a thorough revision of both the contents and the development of the subject found in the first edition [cf. these Rev. 8, 545]. The development of the subject is more deliberate and better organized. Familiar ideas of the theory of elasticity are more frequently used as an introduction to plastic behavior. On the whole, the book is now more readable.

The following new topics are discussed: simple loading of bodies and connection between the theory of elastic-plastic deformations and the theory of plastic flow; unloading in the theory of elastic-plastic deformations; trigonometric representation of the compounds of stress and strain, torsion of conical bars with nonlinear hardening; new methods of solutions of the plane strain problem; a new analogy for the plane elastic-plastic problem; plane strain state for a generalized stress-strain law; plane equilibrium of a plastic wedge under variable load; plane and axially symmetric equilibrium of a plastic mass between rigid walls; uniform rota-

Source: Mathematical Reviews,

Vol. 13 No. 2

Card 1 of 2

tion of a disk and bending of a round plate with nonlinear hardening.

However, the improvements over the first edition are offset by a number of serious disadvantages. The important developments of the mathematical theory of plasticity outside the USSR during the last three years are largely neglected. For example, the work of Hill and Lee in England, and of Prager, Drucker, and Greenberg in this country is not mentioned. Among the most important omissions the following should be mentioned: (1) Discussion of the inherent difference between finite and incremental stress-strain laws and realization of the fact that finite laws violate certain physical requirements. (2) Realization of the fact that most practical boundary value problems are of mixed character involving surface stresses and surface displacements. Accordingly, the emphasis on statically determinate problems does not seem justified as was shown by the work of Hill and Lee. (3) Discussion of discontinuous stress and velocity fields which often represent the only admissible solution and have also proved useful for approximation purposes. (More recently, such fields have been used successfully in the construction of bounds for the safety factor; since much of this work is not yet published in form other than mimeographed reports, however, the author can not be blamed for ignoring it.)

The chapter headings are as follows: (I) Theories of plasticity; (II) Fundamental equations of plastic equilibrium; (III) Simple problems of elastic-plastic equilibrium; (IV) Plastic torsion of rods; (V) Plane plastic state; (VI) Stress distribution in plastic zones surrounding holes; (VII) Indentation of a plastic body; (VIII) Compression and extrusion of a plastic sheet; (IX) Plane stress state; (X) Plane strain state for a general law of plasticity; (XI) Plane equilibrium of a plastic wedge; (XII) Plane and axially symmetric equilibrium of a plastic mass between rigid walls; (XIII) Elastic-plastic bending of beams and plates; (XIV) Elastic-plastic bending of round plates and rings.

H. I. Ansoff (Santa Monica, Calif.).

Sources: Mathematical Reviews,

Vol 13

No. 4

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SOKOLOVSKIY, V. V.

USSR/Academy of Sciences - Automatics Aug 50
and Telemechanics

"Session of the Department of Technical Sciences"

"Vest Ak Nauk SSSR" № 8, pp 102-109

Briefly reviews reports delivered at May session:
"Improving the Performance Service Life of Sliding
Friction Bearings," by A. D. D'yachkov, Dr Tech
Sci; "On Application of the Theory of Plasticity
for the Solution of Some Technical Problems," by
V. V. Sokolovskiy, Corr Mem, Acad Sci USSR;
V. Z. Vlasov, Dr Tech Sci, discussed principal

results of his work on strength of materials, struc-
tural mechanics and theory of elasticity; V. A.
Trapeznikov, Dr Tech Sci, reported on constructional
principles of devices for automatic control and
regulation.

222T95

222T95

SOKOLOVSKIY, V.V.

303
Sokolovskii, V. V. Plane and axisymmetric equilibrium of a plastic mass between rigid walls. Akad. Nauk SSSR. Prikl. Mat. Meh. 14, 75-92 (1950). (Russian)

Stress-strain relations of the plastic deformation theory are used with the hardening law given by $S=KE^\mu$, where S and E are the stress and strain intensities, respectively, and K and μ are constants. Assuming that only radial displacement takes place within the wedge, the components of strain are expressed in terms of E and a variable ψ which is a function of the wedge angle θ only. Differential equations for ψ for both the plane and the axially symmetric wedge are derived. Boundary values for ψ are obtained for $\mu \neq 0$ under the assumption of adhesion at the walls, and for $\mu = 0$ under the assumption of a constant friction force at the walls. Numerical solutions are given for $\mu = 1/2$ and $1/3$ for the plane wedge and $\mu = 0, 1/3$ and $2/3$ for the axially symmetric wedge. A solution in closed form is given for $\mu = 0$ for the plane wedge. *H. I. Ansoff.*

Source: Mathematical Reviews, 1950 Vol. 11 No. 8

SOKOLOVSKIY, V.V.

Sokolovskiy, V. V. Plane equilibrium of a plastic wedge.
Akad. Nauk SSSR, Prikl. Mat. Meh. 14, 391-404 (1950).
(Russian)

The author solves three problems of plastic deformation of a plane wedge with linear hardening using the following boundary conditions: (a) concentrated force applied at the apex; (b) a moment applied at the apex; (c) a uniformly distributed load along one face. Problem (a) is solved in closed form and problems (b) and (c) are reduced to a numerical integration of a system of nonlinear ordinary differential equations. The author also solves the plastic-elastic problem of a plane half-space without hardening partly loaded with a uniformly distributed pressure. For the limiting value of the pressure $p = K(\pi + 2)$ the half-space becomes completely plastic and the results reduce to the well-known solution.

H. I. Ansoff.

Source: Mathematical Reviews.

Vol. 17 No. 5 1

SOKOLOVSKIY, V. V.

USSR/Physics - Flow

Nov/Dec 51

"The Limit Equilibrium of a Free-Flowing (Quick) Medium," V. V. Sokolovskiy, Moscow, Inst Mech, Acad Sci USSR

"Priklad Matemat i Mekh" Vol XV, No 6,
pp 689-708

The peculiarities (singularities) of free-flowing (frangible) media possessing int friction but of linear cohesion (coupling) permit one to solve a number of problems in the theory of limit equal by another simpler method than can be done on the basis of the general theory.

198796

USSR/Physics - Flow (Contd)

Nov/Dec 51

Considers certain problems in which zones of limit and elastic states occur at the same time. Gives their solns in closed form or as the integration of nonlinear differential eqs.
Submitted 5 Jul 51.

198796

SOKOLOVSKIY, V. V.

"Theory of plasticity." V. Sokolovskiy. Reviewed by S. I. Gubkin, A. D. Tomlenov.
Izv. AN SSSR Otd. Tekh. na..., No. 5, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1957, Uncl.
2

SOKOLOVSKIY, V. V.

USSR/Engineering - Construction,
Grounds

Jun 52

"Theory of the Limit Equilibrium of Grounds and
Its Application for Design of Hydraulic Struc-
tures," V. V. Sokolovskiy, Corr Mem, Acad Sci USSR

"Iz Ak Nauk, Otdel Tekh Nauk" No 6, pp 809-823

Reviews general theory, previously developed by
author, for grounds possessing int friction and
cohesion and discusses limit equilibriums of
entirely cohesive or entirely loose grounds,

23OT28

i.e., grounds which lack either int friction or
cohesion. Develops approx methods for latter
cases, eliminating cumbersome calcns. States
that methods are applicable for calcn of founda-
tions, slopes, embankments, and relieving walls.

23OT28

SOKOLOVSKIY, V. V.

Aug 52

Civil/Engineering - Construction, Structural Analysis

"Stability of Foundations and Slopes," V. V. Sokolovskiy, Corr Mem Acad Sci USSR

"Iz Ak Nauk SSSR, O T N, No 3, pp 1146-1159

1
t

Develops eqs for limit equil of loose medium without cohesion and demonstrates application of eqs in solution of problems on stability of foundations and slopes. Discusses approx method for evaluating effect of cohesion in loose medium.

262T10

SOKOLOVSKIY, V. V.

USSR/Mathematics - Statics of Friable Mar/Apr 52
Medium

"Approximate Method in Statics of Friable Medium,"
V. V. Sokolovskiy, Inst of Mech, Acad Sci USSR

"Prik Matemat i Mekh", Vol XVI, No 2, pp 246-248

Refers to his previous works (cf. "Statics of Friable Medium" 1942 and "Boundary Equilibrium of Friable Medium," "Prik Matemat i Mekh" 1951, Vol XV, No 6) and supplements it by an approx method which may be of value in some particular cases. Received 22 Dec 51.

20972

SOKOLOVSKIY V. V.

USSR (600)

Strains and Stresses

Stress conditions of a plastic mass inside a non-circular cone.. Prikl mat i mekh.
16 no. 4, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1953. Unclassified.
2

SOKOLOVSKIY, V.V., chlen korrespondent.

Pressure of the fill on a retaining wall. Izv. AN SSSR. Otd. tekh. nauk.
no. 3:347-363 Mr '53. Akademiya nauk SSSR. (MLRA 6:5)

1. Akademiya nauk SSSR. (Earth pressure)

KLUBIN, P.I.; SOKOLOVSKIY, V.V., chlen korrespondent.

Calculation of lock and dock bottoms. Izv. AN SSSR. Otd.tekh.nauk. no.
3:364-376 Mr '53. (MLRA 6:5)

1. Akademiya nauk SSSR (for Sokolovskiy). (Hydraulic engineering)

GVOZDEV, A.A.; SOKOLOVSKIY, V.V., chlen-korrespondent.

Deformations in massive concrete blocks caused by temperature and shrinkage. Izv. AN SSSR Otd.tekh.nauk no.4:493-504 Ap '53. (MLRA 6:8)

1. Akademiya nauk SSSR (for Sokolovskiy). (Concrete blocks)

FLORIN, V.A.; SOKOLOVSKIY, V.V., chlen-korrespondent.

Single problem of consolidating compressible, porous, creeping earth medium.
Izv. AN SSSR Otd.tekh.nauk no.6:797-812 Je '53. (MLRA 6:8)

1. Akademiya nauk SSSR (for Sokolovskiy).

(Soil mechanics)

FLORIN, V.A.; SOKOLOVSKIY, V.V., chlen-korrespondent.

One-dimensional packing of soils with calculations of aging, non-linear creep
and structural deformation. Izv. AN SSSR Otd. tekh. nauk no.9:1229-1234 S '53.
(MLRA 6:10)

I. Akademiya nauk SSSR (for Sokolovskiy).

(Soil mechanics)

SOKOLOVSKIY, V.V.

✓ Sokolovskii, V. V. Statika sypučei sredy. [Statics of granular media.] 2d. ed. Gosudarstv. Izdat. Tehn.-

Teor. Lit., Moscow, 1954. 275 pp. 10.50 rubles.

In this second edition the material of the first edition [1942; MR 6, 27] has been completely rearranged and much new material has been added. In Ch. 1 the classical theory of limiting states of equilibrium is developed. The problem is treated in a purely statical manner by means of the equations of equilibrium and a limiting condition on stress. Since no attempt is made to formulate stress-strain relations, the relevant results of modern limit analysis cannot be used [see, e.g., D. C. Drucker and W. Prager, Quart. Appl. Math. 10, 157-165 (1952); MR 13, 1007; D. C. Drucker, J. Mech. Phys. Solids 1, 217-226 (1953)]. As three-dimensional problems are beyond the reach of this statical theory, the remainder of the book is devoted to the plane problem. The

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SOKOLOVSKIY, V. V.

canonical equations for this are established. Typical boundary-value problems and numerical methods for their solution are given, and mechanical similarity is briefly discussed. Chapters 2 and 3 are devoted to the practical problems of the bearing capacity of foundations and the stability of banks and retaining walls. The importance of stress singularities and lines of rupture is discussed, and problems concerning stratified granular media are presented. Chapters 4 and 5 treat the special cases of cohesionless and frictionless granular materials. The neglect of cohesion or internal friction often makes it possible to obtain solutions to simple boundary-value problems in closed form. The practical use of such solutions is illustrated by several examples. The Bibliography has been considerably expanded and references to non-Russian literature have been included in this revised edition. W. Prager (Providence, R.I.)

2/2

of 6/2

SOKOLOVSKIY, V.V.
SOKOLOVSKIY, V.V. (Moscow)

Some remarks concerning a plane problem in the theory of plasticity.
Prikl.mat. i mekh. 18 no.6:762-763 N-D '54. (MIRA 8:3)

1. Institut mekhaniki Akademii nauk SSSR.
(Plasticity)

, V. V.

LEV BENZON, Leonid Samuilovich, 1879-1951 (deceased); NEKRASOV, A.I., akademik; TIKHONOV, A.N.; IL'YUSHIN, A.A.; SOKOLOVSKIY, V.V.; GALIN, L.A.; SHCHELKACHEV, V.N., doktor tekhnicheskikh nauk; TRABIN, F.A., doktor tekhnicheskikh nauk; GRIGOR'YEV, A.S., kandidat tekhnicheskikh nauk; SEDOV, L.I., akademik, redaktor; ZVOLINSKIY, N.V., professor, redaktor; ALESKEYEVA, T.V., tekhnicheskiy redaktor.

[Collected works] Sobranie trudov. Moskva, Izd-vo Akademii nauk SSSR. Vol. 4 [Hydroaerodynamics. Geophysics] Gidroaerodinamika, Geofizika, 1965. 398 p. (MLRA 8:11)

1. Chlen-korrespondent AN SSSR (for Tikhonov, Il'yushin, Sokolovskiy, Galin)
(Geophysics) (Fluid dynamics)

SOKOLOVSKII, V.V.

✓ Book—1088. Sokolovskii, V. V., Theory of plasticity [Theorie
der Plastizitat], Berlin, VEB Verlag Technik, 1955, 484 pp.
28.40 DM

Originally published in Russian [AMR 5, Rev. 1071], this
translation into German now makes Sokolovskii's work readily
available. The translation is excellent and follows the original
work very well.

W. A. Nash, USA

26

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LEYBENZON, Leonid Samuilovich, akademik; NEKRASOV, A.I., akademik;
TIKHONOV, A.N.; IL'YUSHIN, A.A.; SOKOLOVSKIY, V.V.; SHCHELKACHEV,
V.N., doktor tekhnicheskikh nauk; TIKHONOV, I.A., doktor tekhnicheskikh
nauk, redaktor; GALIN, L.A.; GRIGOR'YEV, A.S., doktor
tekhnicheskikh nauk; CHARNYY, I.A., doktor tekhnicheskikh nauk,
redaktor; ALEXSEYEVA, T.V., tekhnicheskiy redaktor.

[Collected works] Sobranie trudov. Moskva, Izd-vo Akademii nauk
SSSR. Vol.3.[Petroleum engineering] Neftepromyslovaia mekhanika
1955. 678 p. (MLRA 8:10)

1. Chlen-korrespondent AN SSSR (for Tikhonov, Il'yushin, Sokolovskiy and Galin)
(Petroleum engineering)

USSR/Physics - Plasticity

FD-1435

Card 1/1 : Pub. 85 - 4/15

Author : Sokolovskiy, V. V. (Moscow)

Title : Equations of the theory of plasticity

Periodical : Prikl. mat. i mekh. 19, No 1, 41-54, Jan-Feb 1955

Abstract : The author formulates the principal dependences among the components of stress and speed of deformation under the condition of plasticity of general form without any assumption concerning the incompressibility of the material. He conducts a detailed investigation of the equations of two-dimensional plastic equilibrium and indicates different ways to transform them. He gives comparatively simple method for the solution of these equations in the form of trigonometric series. Some forms of the condition for plasticity are considered under which the equations of two-dimensional plastic equilibrium possess the simplest coefficients. Three references: R. Mises (1928); D. Drucker and W. Prager ("Soil mechanics and plastic analyses or limit design," Quarterly of applied mathematics, X, No 2, 1952); V. V. Sokolovskiy (Teoriya plastichnosti, 2nd edition, 1950).

Institution : Institute of Mechanics, Academy of Sciences of the USSR

Submitted : July 29, 1954

SOKOLOVSKIY, V.V.

3853. Sokolovskii, V. V., On the stability of foundation beds of laminated cohesionless material (in Russian), Izvzhezner. Sbornik, Akad. Nauk SSSR 22, 74-82, 1955.

Paper is devoted to solution of a plane stress problem involving a bed of laminated cohesionless granular material of such a nature that it has two different values of the angle of friction, a smaller value related to the horizontal planes and a larger value on all other planes. A limiting state of equilibrium, with the material on the verge of sliding at all points, is assumed throughout the whole mass. Author distinguishes two kinds of regions: the regions of ordinary limiting equilibrium, where the sliding is impending on the inclined planes, and the special regions, where the sliding is due to occur on the horizontal planes. The former regions are subject to the usual differential equations of limiting equilibrium, while different differential equations hold in the latter regions. Author applies this general theory to a semi-infinite mass of soil with a horizontal free surface, one half of which is free of any external loads. The soil region is found to consist of three zones of ordinary equilibrium and a zone of special equilibrium. The boundaries of different zones are found, as well as the stresses in them, and the manner of loading of the second half of the free surface is also determined. A set of graphs and figures illustrate the application of the theory to some particular numerical cases.

A. Hrennikoff, Canada

SOKOLOVSKIY, V. V.

"The Problems of Elastic-Plastic Bending of Plates," a paper read at the Symposium on Plasticity in Strength of Materials and Structural Design, Milan, 25-27 Sep 56

Translation

SOKOLOVSKIY, V. V.

"Über Kontakt-Spannungen in Wänden"
Angewandte Mathematik und Mechanik Band 20 Heft 6 Seite 588-596, 1956
Dieser Arbeit ist ein Originaltext beigelegt.

Sokolovskiy, V.V.

INSTRUMENTATION: SPECTROMETERS

"Neutron Spectrometer. I. Mechanical Beam Interruptor", by V.V. Sokolovskiy, V.V. Vladimirovskiy, and I.A. Radkevich, Pribory i Tekhnika Eksperimenta, No 2, September-October 1956, pp 3-9

Description of the construction of a mechanical interruptor for a beam of neutrons obtained from a nuclear reactor. The interruptor makes it possible to obtain neutron pulses of approximately triangular form and a width at the base of approximately 1 microsecond. The instrument may be used for the investigation of neutron spectra in the energy range from thermal to several thousands of electron volts.

The mechanical interruptor described in this article was used with the neutron selector described at the Geneva Conference.

Card 1/1

SOKOLOVSKIY V. V.

2

✓ Sokolovskii, V. V. On forums of stable semi-arches and arches. Prikl. Mat. Meh. 20 (1956), 73-86. (Russian)
The paper examines the plane limiting equilibrium of a semi-arch of cohesive soil under its own weight. By a semi-arch is meant a mass of soil with a horizontal surface and with an overhang tapering to a point. The shape of the lower surface of the overhang is determined by constructing a stress field at yield in the overhang. The stress field involves a curved line of stress discontinuity. Final results are obtained numerically and in some cases are given in closed form. R. T. Shield.

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SOKOLOVSKIY, V. V.

Distr: 4Eif

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844. Sokolovskii, V. V., Equations for plastic flow in the boundary layer (in Russian), *Prikl. Mat. Mekh.* 20, 3, 328-334, May-June 1956.

Solution of Saint-Venant's equations for stress components in plane plastic flow in neighborhood of curved rigid boundary ($y = 0$), where x and y are orthogonal coordinates in tangential and normal direction of boundary curve, is approximated by $\sigma_x = 2k[s(x) + S - \Phi]$, $\sigma_y = 2k[s(x) + S + \Phi]$, $\tau_{xy} = k[1 - 2\Phi^{-1}]$. Here $2k$ is yield stress in tension and $s(x)$ normal stress at boundary $y = 0$. Functions S and Φ are assumed to be small quantities. Also, velocity components are represented by $u = u(x) + U$, $v = v(x) + V$, where $u(x)$, $v(x)$ are velocity components at boundary and U , V small quantities, vanishing for $y = 0$. From linearized Saint-Venant's equations and boundary conditions at $y = 0$, all quantities S , Φ , U , and V may be determined by integration in finite form. For small distances y from rigid boundary, quantities S , Φ , and U are proportional to y^4 and V to y . Well-known cases of plastic flow with rotational symmetry outside rigid circle and extrusion of plastic material between parallel rough rigid plane walls enter as special cases.

F. K. G. Odqvist, Sweden

open
RTA

SOV/124-58-7-8041

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 7, p 107 (USSR)

AUTHOR: Sokolovskiy, V.V.

TITLE: Some Problems of Earth Pressure (Nekotoryye zadachi o davlenii grunta)

PERIODICAL: V sb.: Materialy k 4-mu Mezhdunar. kongressu po mekhan. gruntov i fundamentostr. Moscow, AN SSSR, 1957, pp 166-174

ABSTRACT: The author sets forth two plane problems of the plastic limit of a soil when allowance is made for its own weight. The first is the problem of the possible shapes of stable anticlines and semianticlines (Sokolovskiy, V.V., Prikl. matem. i mekhan., 1956, Vol 20, Nr 1, pp 73-86; RZhMekh, 1957, Nr 2, abstract 2277). The second is the problem of determining the contact stresses along the contour of a rigid wall (Sokolovskiy, V.V., Prikl. matem. i mekhan., 1956, Vol 20, Nr 5, pp 588-598).

G.S. Shapiro

1. Earth--Configurations
2. Soils--Plasticity
3. Earth--Pressure

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Priklad.Mat.Mech. 20, 764-765 (1956)

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$$\left. \begin{array}{l} \sigma_x \\ \sigma_y \end{array} \right\} = \sigma(1 \pm \sin \varphi \cos 2\varphi) \quad \tau_{xy} = \sigma \sin \varphi \sin 2\varphi .$$

In order to find approximative solutions of σ and φ the author puts

$$\sigma = \gamma \sigma_0(x)y [1 + \sigma_1(x)y + \dots] \quad \varphi = \varphi_0(x) + \varphi_1(x)y + \dots$$

By comparison of coefficients there follows

$$\sigma_0(1 - \sin \varphi \cos 2\varphi_0) = \cos \alpha, \quad \sigma_0 \sin \varphi \sin 2\varphi_0 = \sin \alpha ,$$

$$\sigma_1 = \frac{1}{2R} - \frac{\operatorname{tg}^2 \varphi (1 - \sin \lambda)}{R \sin^2 \lambda}, \quad 2\varphi_1 = \frac{\operatorname{tg} \alpha (1 - \sin \lambda)}{R \sin^2 \lambda}, \quad \cos \lambda = \frac{\cos \varphi}{\cos \alpha} .$$

From this the author obtains approximative values for σ_x , σ_y , τ_{xy} . For $R \sin \lambda < 0$ there follows

$$y \leq |R \sin \lambda| \cdot \frac{\cos^2}{(1 - \sin \lambda)^2} \left(\frac{\operatorname{tg} \varphi}{\operatorname{tg} |\alpha|} - 1 \right) ,$$

i.e. that a continuous limit state is possible only in a certain bounded zone.

INSTITUTION: Moscow.

IX. International Congress on Applied Mechanics.

PA - 2622

(Rabotnov,Yu.N.), "Investigations of Tensile Strength in Plastics!"
(Sokolovskiy,V.V.), "Two Theories on Gas Flows"(Sryetyenskiy,L.I.),
"Dynamics of inelastic threads of variable Length" (Savin,G.N.)
"Integral Equations of the Thin Wing" (Madam Krasil'shchikova,E.A.)
etc. In connection with an analysis of the work carried out this
congress the opinion was expressed that there were too few plenary
sessions.

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under different conditions are studied. Three articles deal with problems of fluid mechanics and gas dynamics. The last 4 articles are on applied mathematics.

Rzharitsyn, A.R., Doctor of Technical Sciences. Taking Humidity and Temperature into Account in Problems of Creep 3
The article contains the following sections: Introduction;
1) Fundamental physical dependence [between stress and deformation]; 2) Approximate solution; 3) Example taking into account the effect of temperature; 4) Another substantiation of the method; 5) Problems concerning drying of a thin plate fixed at the edges; 6) Taking into account the effect of setting concrete.

Rabinovich, A.L., Candidate of Technical Sciences. Torsion of an Element of a Circular Ring (General Saint-Venant Problem) 17
The article contains the following sections: Introduction;
1) Fundamental equations; 2) Checking the solution and expression for rigidity in torsion; 3) Stress function; 4) Ex-

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pression of the potential energy of deformation; 5) Segment of [circular] ring with rectangular cross section.

Meshkova, L.A. Certain Problems on Ultimate Equilibrium of Rocks
The article contains the following sections: Introduction; 1)
Ultimate equilibrium of semiarches with a free contour; 2) Ap-
proximate solution; 3) Determination of the pressure of a rock
on a curved wall; 4) Approximate solution in the neighborhood
of a wall contour.

Geogdzhayev, V.A. Plastic Plane Deformation State of Orthotrop- 55
ic Media

The article contains the following sections: Introduction;
1) Equilibrium of a half plane; 2) Slip of a strip; 3) Dis-
tribution of stresses in the neighborhood of a slot located
at a finite distance from a free straight-line boundary.

Geogdzhayev, V.O. Certain Problems in the Elastic-plastic De- 69
formation of Anisotropic Materials

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Kukudzhanov, N. Elastic-plastic Bending of Thin-walled Beams
Taking into Account Tangential Stresses

97

The article contains the following sections: Introduction;
1) Fundamental equations; 2) Rectangular cross section; 3)
Ultimate state [of a beam]; 4) Thin-wall rods composed of
straight-line elements; 5) Conclusions.

Rabinovich, A.L., Candidate of Technical Sciences; Shtarkov,
M.G. and Dimitriyeva, Ye.I. Methods of Determining the Values
of Elastic Constants of Glass Textolite at Raised Temperature 115
The article contains the following sections: Introduction;
1) Modulus of elasticity of KAST-V [glass textolite] depend-
ing on direction of fibres (at room temperature) 2) Depend-
ence of the strength of KAST-V on the direction of tension
at room temperature; 3) Effect of temperature "hardening"
and of repeated loadings on KAST-V properties; 4) Develop-
ment of the methodology of temperature testing of KAST-V
with strain pickups; 5) Methodology of tests with Martens
device; 6) Frequency method for determination of the

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modulus of elasticity of KAST-V; 7) Stress-strain relationship of KAST-V for different directions in the temperature function; 8) Dependence of the modulus of elasticity of KAST-V on temperature for various directions. 9) The value of Poisson's ratio for KAST-V in temperature function for various directions.

Moiseyev, N.N., Doctor of Physical and Mathematical Sciences. 145
Oscillations of a Body Floating in a Bounded Reservoir.
The article contains the following sections: Introduction;
1) Potential of velocities; motion equation. Mathematical
statement of a problem; 2) General properties of the solu-
tion of the system (1.16); 3) Some remarks on the effective
determination of principal oscillations; 4) Supplements
and generalizations.

Pokhozhayev, S.I. A Problem of Supersonic Flow 167
The article contains the following sections: Introduction;
1) Interaction of centered waves; 2) Reflection from a

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free surface; 3) Interaction of reflected waves.

Nemchinov, I.V. Certain Problems of Gas Dynamics Taking Into Account Dissociation and Ionization of Air. 173
A Generalization of Taylor's Series 190

The article contains the following sections: 1) Lemma 1;
2) Lemma 2; 3) Lemma 3; 4) Abel's theorem; 5) Abel's second
theorem; 6) Tauber's theorem.

Nechepurenko, M.I. Lagrange Series in V_k spaces. 197

Mirakov, V.Ye. Convergence of the Method of Tangential Hyperbolas for Nonlinear Functional Equations Under Conditions of Cauchy Type 204

Babayan, B.A. Arithmetical Operations on Digital Computers [Parallel Type] 214

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report presented at the 1st All-Union Conference of Theoretical and Applied Mechanics,
Moscow, 27 Jun - 3 Feb '60.

234. G. I. Pelenitsyn (Moscow): Large deflections of reinforced
elastic cylindrical shells.
235. V. I. Rabinovich (Moscow); Yu. N. Rabotnov (Moscow):
Cross-spread of turbine discs.
236. A. I. Radovichev (Moscow): Flows and concomitance of seads
under the action of separate forces.
237. Yu. N. Rabotnov (Moscow): On the propagation of elastic-
plastic waves in a half-space.
238. Yu. A. Rabotnov (Moscow): Propagation of disturbances in
continuous media.
239. V. I. Rabotnov (Moscow): Earth pressure on flexible retaining
walls.
240. V. I. Rostov (Moscow): On the pressure of a punch on an
elastic half-space.
241. Yu. G. Rapov (Leningrad): Some difference equations of
structural mechanics.
242. Yu. A. Rabotnov (Moscow): On the propagation of elastic-
plastic waves in a half-space.
243. Yu. A. Rabotnov (Moscow): Earth pressure on flexible retaining
walls.
244. Yu. A. Rabotnov (Moscow): Theory of high molecular and dis-
persive structures and their characteristics associated with
these properties.
245. Yu. A. Rabotnov (Moscow): On the influence of the maximum principal
stress on the fatigue strength of materials.
246. Yu. G. Rapov (Leningrad): The application of the method of homo-
geneous solutions to some two-dimensional problems of the
theory of elasticity.
247. A. B. Rubanitsia (Kiev): Some two-dimensional problems of
static equilibrium in plastic shells.
248. M. I. Sbornik (Moscow): On the application of the
method of principal components to structural theory of
continua.
249. Yu. I. Serezhnikov (Moscow): Some problems of the
mechanical properties of groups.
250. A. S. Slobodcikov (Leningrad): Solution of variational problems
of bending of plates.
251. D. D. Slobodcikov (Leningrad): An approximate study of the
deformation of rock foundations.
252. O. B. Slobodcikov (Kiev): The determination of the
deflection of a circularly supported plate by the method of
successive approximations.
253. V. S. Slobodcikov (Kiev): Form of elastoplastic primitive
here or elongated cross section.
254. I. A. Smirnov (Leningrad): The impact of a double punch
on a half plane.
255. I. A. Smirnov (Kiev): The use of continuity considerations
in solving problems of wave propagation in the domain of shells by
several approximations.
256. Yu. N. Sosulin (Leningrad): Stability of cellular structures
built on ice.
257. Yu. N. Sosulin (Moscow): Oscillations of thin, strengthened
shells supported by an elastic layer of fine particles.
258. Yu. N. Sosulin (Leningrad): Finite bending of plates into
cylindrical shells.
259. Yu. N. Sosulin (Moscow): A base on a one-layer half space
with an elastic limit.
260. Yu. N. Sosulin (Leningrad): Some problems of creep and
generalization of saturated soils.
261. V. G. Stolodkovic (Moscow): Determination of the natural
frequency of plates of constant and variable thickness.
262. Yu. N. Sosulin (Leningrad): Dynamic problems of the design of
flexible walls and soil foundations under impact loads.
263. Yu. N. Sosulin (Leningrad): Solution of some dynamic problems
of storage tanks by the method of initial parameters.
264. Yu. N. Sosulin (Leningrad): On some problems of the theory
of plasticity and soil stability.
265. Yu. A. Sopovitch (Kiev): On classes of solutions
of boundary value problems in plasticity.
266. Yu. N. Sosulin (Kiev): The effect of internal friction
on the strength in beam and plates under repetitive loading.
267. Yu. S. Sosulin (Moscow): Strength in elliptical
shells subjected to external pressures.

SOKOLOVSKIY, Vadim Vasil'yevich; SEREBRYANYY, R.V., red.; KRYUCHKOVA,
V.N., tekhn.red.

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243 p. (MIRA 14:4)
(Soil mechanics)